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To evaluate changes of attitude by vocational educators during a summer workshop in educational research, statistical data was obtained from a sample of four school administrators and 12 vocational education teachers who attended the workshop. Chi-square analysis and a Z test were utilized in evaluating attitude changes based on a pre- and a post-test. Some findings were: (1) A chi-square analysis revealed little significant differences between the pre-test mean score and the post-test mean score, and (3) vocational educators had a favorable outlook on the role of research in their field following the workshop. (DM)

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ATTITUDE CHANGES OF VOCATIONAL EDUCATORS AFTER ATTENDING A THREE-WEEK WORKSHOP IN VOCATIONAL - TECHNICAL EDUCATION RESEARCH

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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INTRODUCTION

Research in Vocational Education

In the past, the consideration for research in vocational education in Wyoming has been negligible. Educators throughout the state have shown little or no responsibility toward the actual improvement of old or the development of new programs, techniques, or procedures in vocational education. This lack of sincere participation in research and development programs in Wyoming toward the improvement of the state's vocational education goals has stemmed from the fact that educators, guidance counselors, administrators, and others lack enough knowledge about procedure, funding, and research design and method to actively pursue the opportunities available. A workshop of the proposed nature was instituted at the University of Wyoming under the guidance of the College of Education, Vocational Education Department and Research Coordinating Unit of the Vocational and Technical Education Division of the Wyoming State Department of Education during the summers of 1967 and 1968. These workshops of two weeks and three weeks duration respectively have formed a basis for future active participation in vocational research as well as providing Wyoming education with an opportunity to become familiar, encouraged, and interested to return to their positions the next fall ready to aid in finding answers to some of their own unique problems.

Purpose of Paper

In order to assess the value of the 1968 workshop in changing the educator's outlook or attitudes toward research in vocational education, an attitude scale or test was devised. This attitude test was constructed to measure the participant's feelings toward eight areas of concern or problems

in vocational education research. The test was administered twice to the participants: once at the beginning of the workshop and once at the conclusion of the three-week program. Thus, it will be possible to obtain from these two tests data which can be evaluated in terms of attitude change resulting from information and discussions provided during the workshop period.

The Nature of Attitudes

Attitudes and attitude changes have been the subject of numerous writers in psychology. A precise definition of attitude is difficult because the concept overlaps with other kinds of psychological concepts. Gordon Allport (1:8) in 1935, defined an attitude as "A mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related." At the same time, he referred to the concept of attitude as the most distinctive and indispensable concept in the whole field of social psychology.

In regard to attitude change, Sherif (1:10) maintains that in its simplest form," ...the problem of attitude change is the problem of the degree of discrepancy between one's own position and the position advocated in a message; and the felt necessity of coping with that discrepancy." Recent research and theorizing conclude that attitudes can be changed, (a) when a message which relates to the individual's needs and wants is presented in such a way and at such a time that it is reinforced by related events, (b) when the change is "guaranteed" social support and (c) where channels of action or obstacles to action are pointed out.

However, measuring attitudes and attitude changes does present the problem of measuring many variables. Thurstone (1:15) said in this

respect, "We must postulate an attitude variable which is like practically all other measurable attributes in the nature of an abstract continuum, and we must find one or more indices which will satisfy us to the extent that they are internally consistent." In measuring attitude changes in this paper, the participant's attitude is expressed by the marking on a scale ranging from strongly disagree to strongly agree. The attitude is then represented as a point on an attitude continuum and the attitude change is the deviation from the previous point as taken from the post-test.

PROCEDURE

The Sample

The sample was composed of sixteen participants who were involved in public education in Wyoming and two other states, with four of the participants being school administrators and the remaining twelve coming from the areas of Business and Office Education, Distributive Education, Home Economics Education, Vocational Agriculture, Industrial Arts, and Guidance.

Statement of Problem

The following null hypothesis was to be tested in order to compare and contrast the results of the pre-test and the post-test: There is no significant difference in the attitude change of the participants as a result of the three-week workshop in vocational education research.

Statistical Procedure

Chi-square and Contingency Tables. After the data was assembled and processed, it was necessary to determine if a significant difference existed between the results of the pre-test and the post-test. It was decided that this could be determined by the use of contingency tables.

In order to understand and follow the statistical procedure used in determining chi-square, the following symbols and their meanings were listed:

O = number observed

E = number expected

i = the rows

j = the columns

R_i = total observed number the ith row found by adding across the row

C_j = total observed number in the jth column found by adding down the column

N = sample size

After first placing the observed data into the contingency table, it was necessary to compute the expected numbers for each cell of the table. The following formula was used to accomplish this process: $E_{ij} = \frac{R_i C_j}{N}$. It was next necessary to compute the contribution of each individual cell of the table to the multinomial chi-square; the following formula accomplished this process: $\frac{(O_{ij} - E_{ij})^2}{E_{ij}}$. In the forty chi-square problems of this study, there were six row times columns contributions, the sum of which was equal to the calculated chi-square (X^2). This process expressed in a formula would be: $X^2 = \sum_{i,j} \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$.

After the chi-square was computed, it was necessary to determine the degrees of freedom in the contingency tables. This was accomplished by multiplying the number of rows less one by one less the number of columns, (r-1) (c-1). In this study, there were two rows and three columns, consequently, the resulting degrees of freedom were two.

With this information, it was then possible to test the previously stated null hypothesis for each statement which was: There is no significant difference in the attitude change of the participants as a

result of the three-week workshop in vocational education research. Each null hypothesis was tested at the 0.05 level of significance using two degrees of freedom. According to the chi-square distribution table, it was found that any chi-square above 5.991 would reject the null-hypothesis, therefore allowing the statement that there was a significant difference in the results of the two tests which could not be contributed to chance. Each of the forty null hypotheses were either accepted or rejected according to the above process.

Arithmetic Mean and Standard Deviation. The arithmetic mean or average is the best known measure of central tendency. The mean scores of the pre-test and the post-test was computed to determine the numberical gain or loss achieved from the pre-test to the post-test.

The following symbols and their meanings with the resulting formula are as follows (2.68):

M = mean

ZX = sum of scores of each test

n = sample size

$M = \frac{ZX}{N}$

The standard deviation is the most reliable measure of variability and is used in this study to determine each participant's variance from the mean score on each test. The formula for the standard deviation is as follows (2:70): $\sim = \sqrt{\frac{\Sigma x^2}{N}}$

In order to calculate the participant's score achieved on each test, a value was placed on each point of the continuum scale: 5 = strongly agree, 4 = agree, 3 = disagree, 2 = strongly disagree, and 1 = undecided.

The points were reversed if the opinion stated happened to be negatively; except that "undecided" still remained equal to value of one.

Standard Error of the Difference between Correlated Means. In the following study it was necessary to determine how significant was the score or attitude change from the pre-test to post-test due to the workshop. A reliable measure for this type of comparison is the standard error of the difference between the means. Since the samples for the two tests were gathered from the same sixteen participants, the formula must account for the correlation between the means. This is necessary because the means in pairs of samples tend to rise or fall together. The formula for the standard error of the difference between correlated means is derived by the following (2:185):

The symbols describe the above formula:

σ_{dm} = standard error of the difference between correlated means

σ_{m_1} = standard error of $mean_1$

σ_{m_2} = standard error of $mean_2$

r_{12} = coefficient of correlation between the scores made the pre-test and the post-test.

The results of this formula will determine whether or not the null hypothesis will be accepted or rejected. A $\bar{z}$ score will then provide the critical measure for this statistical test. The $\bar{z}$ score is a ratio determined from the following formula:

$$\bar{z} = \frac{M_1 - M_2}{dm}$$

In this formula the $\bar{z}$ value equals the difference between the two means divided by the standard error of the difference of the correlated means. The .05 level of significance will be considered the critical area of acceptance or rejection of the null hypothesis.

PRESENTATION OF RESULTS

The results of this study may be examined by referring to the ten tables which follow. Included in Tables I through VIII are the following: the statements which appeared on the opinionaires; the participants' response to each statement according to one of the three possible degrees of answer, agree, no opinion, and disagree and the computed chi-square for each statement. Tables IX and X represent the data of the standard error of the difference between the correlated means, the scores made on the two tests by the participants, and the mean scores and standard deviations of the two tests.

Discussion of the Attitude Statements

The information presented in Tables I through VIII showed that in two of the forty statements used in this study, there was a significant difference in the way the participants responded on the two tests which could not be due merely to chance at the .05 level of significance. For purpose of discussion, it is possible to classify all statements into one of eight general areas: (1) the role of research as related to social progress; (2) the vocational educator's role in research; (3) the methodology in research; (4) the value of research to the researcher; (5) research course in the school setting; (6) the financing and administration of vocational education; (7) the school and community relationship in regard to research; and (8) the vocational educator's role in adult education.

(1) The first six statements referred to common conceptions of the role research has as related to social progress. On these six statements, little influence was made by the workshop on the participants' attitudes with none of the null hypotheses being rejected. The participants were

generally in agreement on the importance of research in supporting social progress, and they were also strongly aware of the need for research in providing individual well-being. Table I presents this data.

TABLE I

RESEARCH RELATIONSHIPS TO SOCIAL PROGRESS

STATEMENTS	PRE-TEST			POST-TEST			COMPUTED
	D	N	A	D	N	A	X^2
1. Because of vested interests in the "status quo" from a fearful distrust of new ideas, some individuals and groups do not want scientists to "jar people out of their traditional patterns of thought and behavior."	3	0	13	1	0	15	1.17
2. Because of inertia, ignorance, or the belief that further advances in knowledge cannot be made, some people ridicule the efforts of research workers.	6	1	9	5	0	11	2.16
3. Indiscriminate admiration of scientists can also hamper social progress.	5	1	10	5	1	10	0
4. Most laymen approve of applied research that produces plainly practical and immediately useful findings but are less enthusiastic about supporting pure research that strives to develop new knowledge about the fundamental laws of nature.	2	2	12	4	0	12	1.60
5. Many teachers are quite willing to accept changes in technical fields, but they are reluctant to changes that alter their social institutions.	6	0	10	4	0	12	.58
6. If teachers acquire sufficient knowledge of research to the relationship between scientific findings and their individual well-being they will be more willing to assume the responsibility necessary to promote investigations.	3	0	13	1	0	15	2.40

(2) Statements seven, eight, and nine were directed toward the relationship between research and the vocational educator in respect to utilizing research findings in his classroom activities. A major attitude change was noted in statement eight which was significant at the .05 level, thus rejecting the null hypothesis. Table II shows that the participants significantly changed their attitude in regard to the "twenty-five year lag in utilizing research findings in the classroom." The other two statements did not cause any noticable change.

TABLE II

VOCATIONAL EDUCATORS ROLE IN RESEARCH

STATEMENTS	PRE-TEST D	PRE-TEST N	PRE-TEST A	POST-TEST D	POST-TEST N	POST-TEST A	COMPUTED X^2
7. Vocational educators must be sufficiently informed about research to help pupils gain an understanding of the role that scienfic investigations play in promoting progress in vocational education.	0	1	15	1	1	14	1.50
8. A twenty-five year lag exists in vocational education research findings and their applications into the classrooms.	5	3	8	1	0	15	6.06
9. Vocational educators retard the professionalization of their educational field if they regard research as an expendable academic appendage.	4	1	11	4	1	11	0

(3) Methodology or the type of research methods to be employed in vocational education research was the classification of statements ten through fifteen. The statements concerned the scientific method, the use of hypotheses and the statistical techniques currently being used in vocational education research. Statement fifteen was nearly significant at the .07 level, but

in analyzing the data in Table III this movement resulted from a change from "undecided" to a position of "agreement". Statement ten showed some movement but it also was not significant. Both of these movements could be attributed to the gain in new knowledge in research techniques rather than a basic attitude change.

TABLE III

METHODOLOGY IN VOCATIONAL EDUCATION RESEARCH

STATEMENTS	PRE-TEST D	U	A	POST-TEST D	U	A	COMPUTED X^2
10. The scientific method replaces unsystematic fact gathering and the premises are tested probabilities rather than assumed truths.	4	2	10	1	0	15	4.50
11. In the selection of a problem for investigation, the primary considerations are that they be ones in which the person has experience and knowledge in which he is competent.	10	0	6	6	0	10	2.00
12. Hypotheses serve as assumed answers to the researcher, the correctness of which he assesses in the course of his study.	0	0	16	1	0	15	.53
13. The comparative evaluation of different teaching methods or the relative effect on learning of various teaching materials would be carried out with the experimental method.	0	1	15	2	1	13	3.00
14. Almost all empirical research requires some sort of statistical analysis so that the outcome of the study can be evaluated.	0	2	14	1	1	14	.84
15. An overwhelming percentage of studies in vocational education are descriptive and most of these are normative surveys of one kind or another.	0	4	12	0	1	15	5.00

(4) Statements sixteen through twenty were concerned with the value of research to those involved in research. These include such statements as, "Does research provide opportunity for leadership, moral and ethical values," and "Is research a waste of public funds and individual efforts." The results show that no marked change of attitude appeared from the workshop as the participants were all strongly committed beforehand to the value of research to the individual and to society. Table IV presents the data for these statements.

TABLE IV

VALUE OF RESEARCH TO THE RESEARCHER

STATEMENTS	PRE-TEST D	N	A	POST-TEST D	N	A	COMPUTED X^2
16. Research offers training for leadership.	5	1	10	7	2	7	1.66
17. There is no need for concern over the present shortage of vocational education researchers.	16	0	0	15	0	1	.53
18. The expenditure of funds for vocational education research is unnecessary and wasteful.	16	0	0	16	0	0	0
19. There are many opportunities for the development of moral and ethical conduct in vocational education.	0	0	16	1	0	15	.53
20. Research in vocational education contributes nothing of value to out culture.	16	0	0	15	1	0	.53

(5) Research courses in the academic setting was the heading for statements twenty-one through twenty-seven. These statements were concerned with the participants' attitude toward research courses in the college curriculum. Statements were directed at whether or not the participants considered research classes "fun", whether or not they would take

a research class as an "elective," and the content or knowledge of what a research class should be concerned with. Again, no significant attitude change was noted in these seven statements. In statement twenty-four, concerning whether or not research classes are fun, some movement was noted but its chi-square value was only significant at the .40 level. Overall, the participants were impressed by the demands that a research class places upon them. Table V presents the data for these statements.

TABLE V

RESEARCH COURSES IN THE COLLEGE CURRICULUM

STATEMENTS	PRE-TEST D	PRE-TEST N	PRE-TEST A	POST-TEST D	POST-TEST N	POST-TEST A	COMPUTED X^2
21. Vocational educators should not be required to take research courses if they have good grades in academic subjects.	16	0	0	10	0	0	0
22. Vocational educators rarely take part in research activities	1	4	11	4	0	12	3.90
23. If research were an elective, I would elect to take it.	1	4	11	0	3	16	2.64
24. Research classes are fun.	4	8	4	3	5	8	3.29
25. Vocational educators should be required to do more research in their own specific class situations.	1	2	13	3	0	13	3.00
26. Knowledge and information change so rapidly that the information gained in school is not valuable since it is soon out of date.	15	0	1	11	2	3	3.62
27. Certain facts and knowledge are necessary for the study of all subjects and these facts do not change very much.	5	0	11	4	2	10	1.14

(6) Statements twenty-eight through thirty-two were concerned with the financing and administration of vocational education. Statement twenty-eight presents an interesting problem to study. Significant at the .05 level with a chi-square score of 6.20, the participants responses changed from only one "disagree" response in the pre-test to six "disagree" responses in the post-test. The statement was concerned with the possibility of reimbursement for individual and professional advancement. The workshop appeared to turn the participants' thinking against receiving outside help for their individual and professional advancement. Statement twenty-nine which is similar to statement twenty-eight, showed no movement and strongly indicated the participants' feeling on receiving financial aid for renewal of their certification. The participants, according to Table VI, were in full accord on statement thirty that Federal involvement does not lead to more Federal direction and less teacher control.

TABLE VI

FINANCING AND ADMINISTRATION OF VOCATIONAL EDUCATION

STATEMENTS	PRE-TEST D	PRE-TEST N	PRE-TEST A	POST-TEST D	POST-TEST N	POST-TEST A	COMPUTED X^2
28. Teachers and other educators should be reimbursed for participation in activities that allow for their own individual advancement and professionalization.	1	7	8	6	5	5	6.20
29. Vocational educators should be reimbursed for the renewal of their teaching certificates.	6	6	4	7	5	4	1.81
30. Federal involvement in vocational education and research leads to more Federal direction and less teacher originality and individualism in the classroom.	14	2	0	13	1	2	1.64
31. The responsibility for education research lies with state departments of education and institutions of higher learning.	7	0	9	11	1	3	3.30
32. Research projects are stifled by lack of administrative direction.	5	2	9	4	3	8	2.72

(7) Research and community relations was the topic of statements thirty-three through thirty-seven. From Table VII it appears that there was some movement among all five of these statements, but none were significant at the .05 level. The highest chi-square value was statement thirty-three which had a negative movement. Most of the participants believed that it was better to continue a research project even though it may be strongly opposed by the community or the school administration. A slight change was also noted in statement thirty-six where the participants believed that citizen advisory groups should be involved in the research projects. The role of advisory groups are important in all aspects of vocational education.

TABLE VII

RESEARCH AND SCHOOL-COMMUNITY RELATIONSHIPS

STATEMENTS	PRE-TEST D	N	A	POST-TEST D	N	A	COMPUTED X^2
33. The community should be kept informed of the progress of research projects.	0	3	13	3	1	12	3.90
34. Research in vocational education should be designed to enhance the institution conducting the research.	6	0	10	9	1	6	2.10
35. In many cases research is more important than instruction.	6	3	7	8	2	6	3.14
36. When feasible community citizens' groups should be involved in the research project.	0	4	12	0	1	15	3.34
37. When there is strong opposition either administrative or community, to a research project, it is usually considered best to abondon the project than to cause hard feelings.	10	5	1	9	3	4	2.35

(8) Adult education and the vocational educator's role in adult education were the concern of statements thirty-eight, thirty-nine, and forty. Table VIII presents the data for this area. Statement thirty-nine marked the highest chi-square value (4.25) but was not significant at the .05 level. This movement revealed some change in the participants' thinking that adult education's primary function is, perhaps, fundamental math and basic reading skills. The participants were all in agreement on both tests that adults are as capable as high-school age students in learning ability.

TABLE VIII

ADULT EDUCATION AND THE VOCATIONAL EDUCATOR

STATEMENTS	PRE-TEST D	PRE-TEST N	PRE-TEST A	POST-TEST D	POST-TEST N	POST-TEST A	COMPUTED X^2
38. Vocational education and adult education are synonomous terms when taught to an out-of-school person.	8	1	7	7	2	7	.38
39. Adult education is designed primarily to improve the adult's basic reading and math skills.	1	5	1	12	1	3	4.25
40. Research in adult education shows that the adult is not as capable of learning as is the high-school student.	14	2	0	14	1	1	.57

Difference between the Means

To further determine the overall value of the workshop, a second test of evaluation was performed in which the mean scores and the standard deviations between the pre-test and the post-test were compared.

In order to calculate the participants' score achieved on each test, a value was placed on each point of the continuum scale ranging from five to one. The test scores are shown in Table IX. Also presented are the mean scores and the standard deviations obtained from each test. On the pre-test, the mean score was 142.3 with a standard deviation of 12.03, while on the pst-test, the mean score was 151.5 with a standard deviation of 7.25.

TABLE IX

PARTICIPANTS' RAW SCORES ON PRE-TEST AND POST-TEST, MEANS, AND STANDARD DEVIATION FROM WORKSHOP ON RESEARCH IN VOCATIONAL EDUCATION

PARTICIPANT	PRE-TEST	POST-TEST	GAIN OR LOSS
A	161	160	-1
B	158	166	+8
C	156	151	-5
D	155	153	-2
E	150	151	+1
F	148	148	0
G	147	155	+8
H	146	148	+2
I	145	149	+4
J	139	147	+8
K	135	143	+8
L	133	153	+20
M	131	150	+19
N	127	146	+19
O	124	148	+24
P	122	156	+34
(Mean)	(142.3)	(151.5)	(9.2)
(Standard Deviation)	(12.03)	(7.25)	(+4.78)

In further analyzing this data, it is noted that twelve participants' scores rose, three scores fell, and one remained the same. The largest gain in the scores was made by participant P who gained 34 points, followed by participant O with 24 points, participant L with 20, and participants M and N with 19 points.

To test the significance of the difference in the mean scores from the pre-test and the post-test, the statistical test of the standard error of the difference between correlated means was performed. The results of this test was significant to the .001 level with a $\bar{z}$ score of 3.32. Thus the null hypothesis, that there is no significant difference between the means, was rejected.

It is necessary to derive a correlation coefficient between the two means when performing the test for the standard error of the difference between correlated means. This correlation coefficient demonstrates the amount of movement among the participants' positions between the pre-test and the post-test. A positive correlation coefficient value (+1.00) would indicate no change in position while a negative value (-1.00) would indicate a complete reversal of positions. The correlation coefficient on this test resulted in a value of +.40 which indicates a rather large movement between the tests for each participant. Table X shows the relative changes in positions between the pre-test and the post-test.

TABLE X

PARTICIPANTS' CHANGES IN POSITION
FROM PRE-TEST TO POST-TEST

PARTICIPANT	PRE-TEST	POST-TEST
A	1	3
B	2	1
C	3	8
D	4	6
E	5	7
F	6	13
G	7	4
H	8	12
I	9	10
J	10	14
K	11	16
L	12	5
M	13	9
N	14	15
O	15	11
P	16	2

SUMMARY AND CONCLUSION

SUMMARY

The purpose of this study was to determine if there was any significant attitude change of the vocational educators after attending a workshop in research. There were sixteen participants in the three-week workshop who were administered the attitude test before the workshop and at the conclusion of the workshop. Their responses were divided into three catagories, agree, no opinion, and disagree. These responses were evaluated by the use of contingency tables which resulted in a chi-square above 5.991 meant the rejection of the null hypothesis for that statement. Using this method, it was found that in only two of the forty statements, there was a significant difference in the attitude change of the participants between the pre-test and the post-test.

The standard error of the mean difference between the two means was performed resulting in a $\bar{z}$ score of 3.32 which is significant at the .001 level. The $\bar{z}$ score indicates a significant difference in the two tests which is not due merely to chance. The pre-test mean score was 142.3 with a standard deviation of 12.03 while the post-test mean score rose to 153.4 with a standard deviation of 7.25.

CONCLUSION

Although the chi-square tests revealed only two statements significant at the .05 level, many other statements did indicate some movement. If the study had involved a larger sample, these statements possibly would have been significant too. However, the highly significant score

on the difference between the means indicate that the rise in the mean scores was a result of the workshop.

It appears that the vocational educators had a much more favorable outlook upon the role of research in their field after the workshop than they had before it. Only through experiencing research in an environment that stresses personal involvement can the individual vocational educator realize the importance of research to his everyday professional life. The workshop did provide a meaningful research experience for these educators. However, the true results of the workshop will only be determined after several years and only then after examining the amount and quality of the research projects these participants have produced. The use of better teaching methods and new ideas in the classroom which have been produced through research will be the best results of the workshop.

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APPENDIX

ATTITUDES TOWARD RESEARCH IN VOCATIONAL EDUCATION

Instructions: Given below are 40 statements on vocational education research ideas and problems about which we all have beliefs, opinions, and attitudes. We all think differently about such matters, and this scale is an attempt to let you express your beliefs and opinions. Respond by circling your attitude to the statement.

1. Because of vested interests in the "status quo" or from a fearful distrust of new ideas, some individuals and groups do not want scientists to "jar" people out of their traditional patterns of thought and behavior.

   Strongly disagree Disagree Undecided Agree Strongly agree

2. Because of inertia, ignorance, or the belief that further advances in knowledge cannot be made, some people ridicule the efforts of research workers.

   Strongly disagree Disagree Undecided Agree Strongly agree

3. Indiscriminate admiration of scientists can also hamper social progress.

   Strongly disagree Disagree Undecided Agree Strongly agree

4. Most laymen approve of applied research that produces plainly practical and immediately useful findings but are less enthusiastic about supporting pure research that strives to develop new knowledge about the fundamental laws of nature.

   Strongly disagree Disagree Undecided Agree Strongly agree

5. Many teachers are quite willing to accept changes in technical fields, but they are reluctant to changes that alter their social institutions.

   Strongly disagree Disagree Undecided Agree Strongly agree

6. If teachers acquire sufficient knowledge of research to see the relationship between scientific findings and their individual well-being, they will be more willing to assume the responsibility necessary to promote investigations.

   Strongly disagree Disagree Undecided Agree Strongly agree

7. Vocational educators must be sufficiently informed about research to help pupils gain an understanding of the role that scientific investigations play in promoting progress in vocational education.

   Strongly disagree Disagree Undecided Agree Strongly agree

8. A twenty-five year lag exists in vocational education research findings and their application into the classrooms.

   Strongly disagree Disagree Undecided Agree Strongly agree

9. Vocational educators retard the professionalization of their educational field if they regard research as an expendable academic appendage.

   Strongly disagree Disagree Undecided Agree Strongly agree

10. The scientific method replaces unsystematic fact gathering and the premises are tested probabilities rather than assumed truths.

    Strongly Disagree Disagree Undecided Agree Strongly agree

11. In the selection of a problem for investigation, the primary considerations are that they be ones in which the person has experience and knowledge in which he is competent.

    Strongly disagree Disagree Undecided Agree Strongly agree

12. Hypotheses serve as assumed answers to the researcher, the correctness of which he assesses in the course of his study.

    Strongly disagree Disagree Undecided Agree Strongly agree

13. The comparative evaluation of different teaching methods or the relative effect on learning of various teaching materials would be carried out with the experimental method.

    Strongly disagree Disagree Undecided Agree Strongly agree

14. Almost all empirical research requires some sort of statistical analysis so that the outcome of the study can be evaluated.

    Strongly disagree Disagree Undecided Agree Strongly agree

15. An overwhelming percentage of studies in vocational education are descriptive and most of these are normative surveys of one kind or another.

    Strongly disagree Disagree Undecided Agree Strongly agree

16. Research offers training for leadership.

    Strongly disagree Disagree Undecided Agree Strongly agree

17. There is no need for concern over the present shortage of vocational education researchers.

    Strongly disagree Disagree Undecided Agree Strongly agree

18. The expenditure of funds for vocational education research is unnecessary and wasteful.

Strongly disagree Disagree Undecided Agree Strongly agree

19. There are many opportunities for the development of moral and ethical conduct in vocational education.

Strongly disagree Disagree Undecided Agree Strongly agree

20. Research in vocational education contributes nothing of value to our culture.

Strongly disagree Disagree Undecided Agree Strongly agree

21. Vocational educators should not be required to take research courses if they have good grades in academic subjects.

Strongly disagree Disagree Undecided Agree Strongly agree

22. Vocational educators rarely take part in research activities.

Strongly disagree Disagree Undecided Agree Strongly agree

23. If research were an elective, I would elect to take it.

Strongly disagree Disagree Undecided Agree Strongly agree.

24. Research classes are fun.

Strongly disagree Disagree Undecided Agree Strongly agree

25. Vocational educators should be required to do more research in their own specific class situations.

Strongly disagree Disagree Undecided Agree Strongly agree

26. Knowledge and information change so rapidly that the information gained in school is not so valuable since it is soon out of date.

Strongly disagree Disagree Undecided Agree Strongly agree

27. Certain facts and knowledge are necessary for the study of all subjects and these facts do not change very much.

Strongly disagree Disagree Undecided Agree Strongly agree

28. Teachers and other educators should be reimbursed for participation in activities that allow for their own individual advancement and professionalization.

Strongly disagree Disagree Undecided Agree Strongly agree

29. Vocational educators should be reimbursed for the renewal of their teaching certificates.

Strongly disagree Disagree Undecided Agree Strongly agree

30. Federal involvement in vocational education and research leads to more Federal direction and less teacher originality and individualism in the classroom.

Strongly disagree Disagree Undecided Agree Strongly agree

31. The responsibility for education research lies with state departments of education and institutions of higher education.

Strongly disagree Disagree Undecided Agree Strongly agree

32. Research projects are stifled by lack of administrative direction.

Strongly disagree Disagree Undecided Agree Strongly agree

33. The community should be kept informed of the progress of research projects.

Strongly disagree Disagree Undecided Agree Strongly agree

34. Research in vocational education should be designed to enhance the institution conducting the research.

Strongly disagree Disagree Undecided Agree Strongly agree

35. In many cases research is more important than instruction.

Strongly disagree Disagree Undecided Agree Strongly agree

36. When feasible, community citizens groups should be involved in the research project.

Strongly disagree Disagree Undecided Agree Strongly agree

37. When there is strong opposition, either administrative or community, to a research project, it is usually considered best to abandon the project than to cause hard feelings.

Strongly disagree Disagree Undecided Agree Strongly agree

38. Vocational education and adult education are synonomous terms when taught to an out-of-school person.

Strongly disagree Disagree Undecided Agree Strongly agree

39. Adult education is designed primarily to improve the adult's basic reading and math skills.

Strongly disagree Disagree Undecided Agree Strongly agree

40. Research in adult education shows that the adult is not as capable of learning as is the high school student.

Strongly disagree Disagree Undecided Agree Strongly agree